ABSTRACT

A brushless permanent magnet electric motor or generator having a hollow rotor, is provided with apertures in ends of the rotor. The apertures allow air to flow through the center of the hollow rotor and remove heat from the rotor. Vanes or blades can be fixed to the shaft within the rotor or fixed to ends of the rotor to force air through an interior of the hollow rotor. Ends of the rotor can be shaped to form fan blades that draw air through the interior of the rotor. Air flowing through the rotor can be recirculated by flowing back through passageways formed between the stator and the motor/generator casing, through passages through the stator, and/or back through an air gap between the stator and the rotor.